

**UL 8750**  
**LED Controllers, Drivers**  
**&**  
**LED Lighting Units**

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LITE-UL 8750-1

Date: Jan. 2010



# Outline

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Overview Of LED Components

2

Component Types and CCN

3

Construction

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# LED Lighting Components

An LED light source consists of one or more of the following component parts:

a) LED package, array, or module that converts electrical energy to light (400 – 700 nm) or UV radiation (180 – 400 nm) or infrared radiation (700 nm – 3000 nm), and heat,

c) Control (controller) circuitry that may switch, dim or otherwise control the electrical energy to the LEDs.

b) Power source that supplies the proper voltage and current to operate the LEDs,

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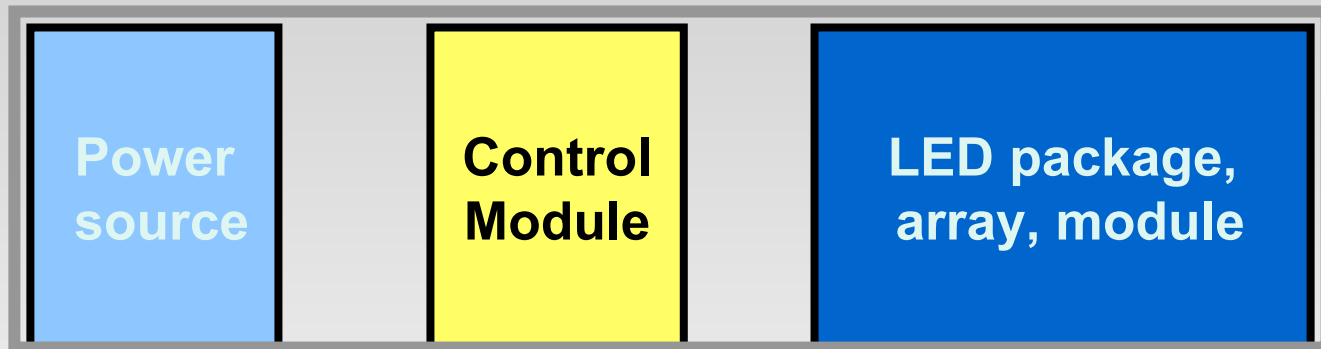
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# LED Lighting Components

## Complete LED Component System



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# COMPONENT DEFINITIONS



**LED PACKAGE** –An assembly of one or more LED die that contains wire bond connections, possibly with an optical element and thermal, mechanical, and electrical interfaces.



**LED ARRAY (LED MODULE)** – An assembly of one or more LED discrete electronic components on a printed circuit board, typically with optics and additional thermal, mechanical, and electrical interfaces.

# COMPONENT DEFINITIONS



**LED CONTROL MODULE (LED CONTROLLER) – Circuit module between the Power Source and LED Array or Module to limit voltage and current, dim, switch or otherwise control the electrical energy.**



**LED DRIVER – A power source that adjusts the voltage or current to LEDs, ranging in complexity from a resistor to a constant voltage or constant current power supply. Also referred to as Lamp Control Gear.**

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# LED Drivers and Power Supplies

## LED Driver

1. One CCN – FKSZ, FKSZ2
2. Generally Constant Current
3. Class 2 output or Other than Class 2
4. Standards—UL 1310, UL 1012, UL 60950 & UL 8750

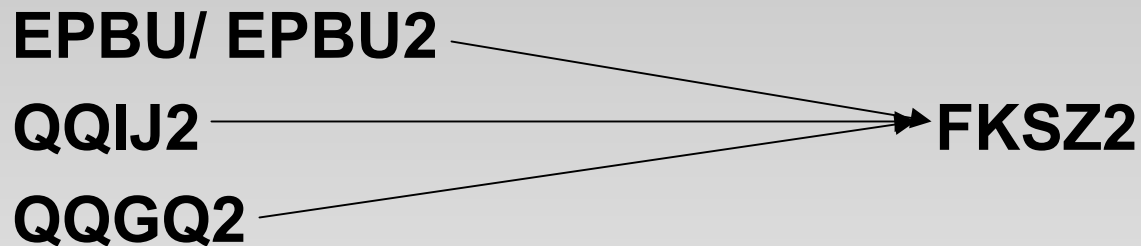
## Power Supply

1. Several CCNs
  - a) EPBU/ EPBU2
  - b) QQIJ2
  - c) QQGQ2
2. Generally Constant Voltage
3. Output dependent on CCN
4. Standards –
  - a) EPBU – UL 1310
  - b) QQIJ2 – UL 1310 or UL 1012
  - c) QQGQ2 – UL 60950



# Power Supplies $\Rightarrow$ LED Driver

**Power supply for LEDs is now being directed to the LED driver category across the board.**



**Additionally for CE where CB Scheme Report is needed, the LED Driver will be under QQGQ2 with a legacy report under FKSZ2**





# LED Driver Versus LED controller

## LED Driver

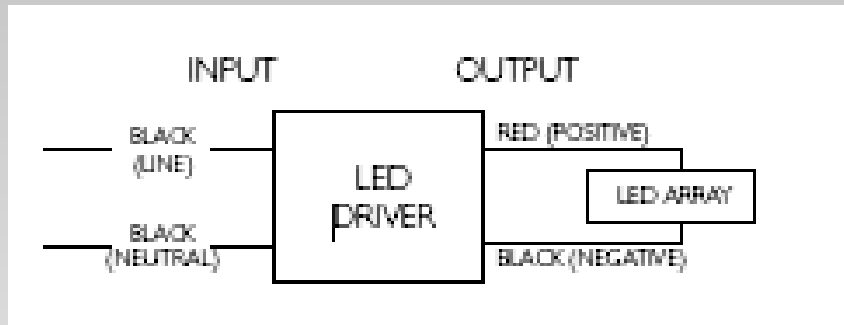
1. AC branch circuit supply on input and AC or DC output
2. Output connected to LED Load or LED Controller

## LED Controller

1. Wired between LED Driver and LED Loads
2. Low voltage input with generally constant current output.
3. Frequently for RGB 350 and 700 ma.



# LED Drivers



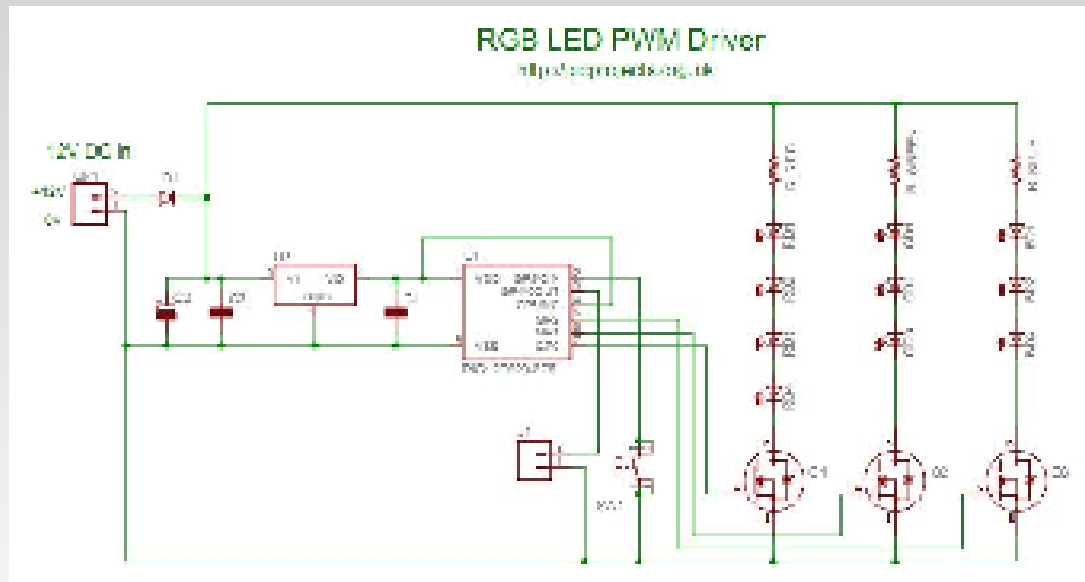
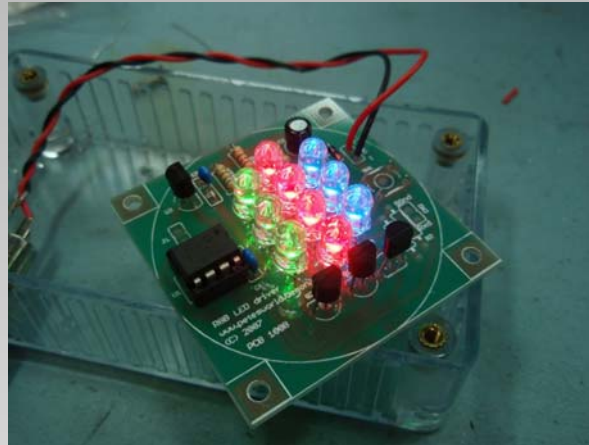
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# LED Controllers, OOQA2



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# LED Controllers, OOQA2



## EXAMPLE CONTROLLER

- 1. Auto adaptable for LED lights with voltage from DC5-24V.**
- 2. Channel RGB full color control, maximum outputs 6A per Channel.**
- 3. Modes of color skipping, color gradual changes , with color depth maximum 256 levels per RGB.**

# LED Drivers Listing Versus Recognition

## Listing – FKSZ ( See next Slide for FKSZ2)

- 1. Stand alone Power Supply with full enclosure**
- 2. Remote from end product.**
- 3. Provided with means for connect to a branch circuit supply such as follows:**
  - a. Power supply cord connected**
  - b. Conduit connection means and wiring compartment.**
- 4. Must comply with all of the requirements in UL 8750, including markings.**



# Listed LED Drivers, FKSZ

**Fixed Type  
with JBox**



**Through-cord/  
Cord connected  
Type**



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# LED Drivers Listing Versus Recognition

## Recognition – FKSZ2

**All that do not comply with scope of Listing.**

**Recognition if any of the following are true.**

1. Exposed leads, terminals on input.
2. Other than class 2 output and exposed leads or terminals
3. No conduit connection means
4. No wiring compartment



# Recognized LED Drivers, FKSZ2

**Factory Install  
Only with  
Terminals**



**Factory Install  
Only with  
Leads**



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# Led Component Categories

**FKSZ2 – Factory only Drivers for Light-emitting Diode (LED) Arrays, Modules, and Controllers**

**FKSZ – Stand alone LED Driver**

**OOQA2 – Factory only Light-emitting Diode (LED) Arrays, Modules, and Controllers**



# Questions

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